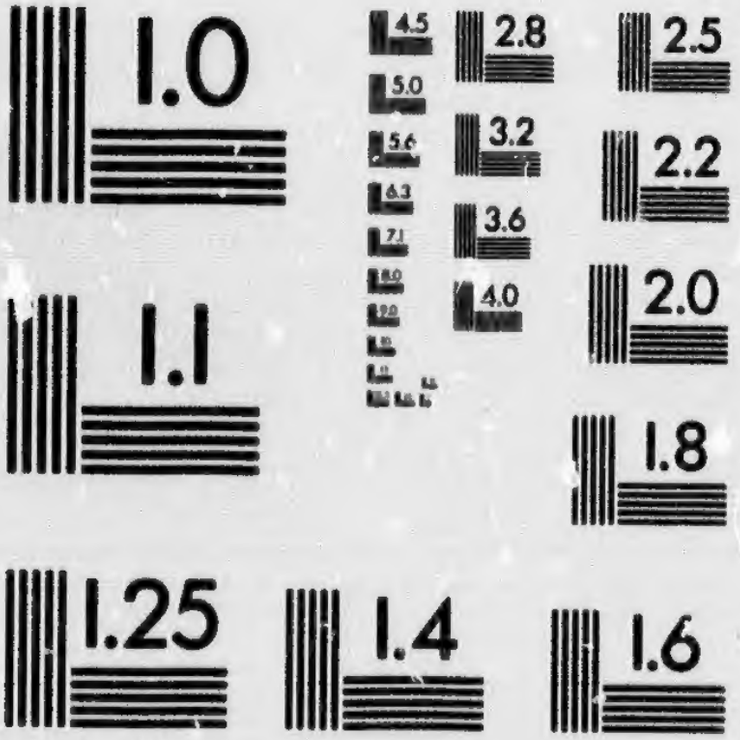
MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



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DENDRITES,

—AND—

BATRACHIANS AND REPTILES OF NOVA SCOTIA.

By A. H. MacKAY, LL. D., F. R. S. C.

From the Proceedings of the Nova Scotian Institute of Science, Vol. IX. Session 1895-96.

Fourth Ordinary Meeting.

City Council Chamber, Halifax, 10th February, 1896.

The President in the chair.

Dr. A. H. MacKay presented for examination by the members of the Institute, a flag of reddish freestone five times the linear dimensions of the reduced photographic representation given below, and bearing on one face a number of very distinct and beautiful dendritic markings representing very closely in general outline the figures and color of some of the finely sprayed, red seaweeds for which they were popularly taken. But, by the ordinary blowpipe tests, the simulated fronds of the red alga turned out to be an oxide of manganese instead of a fossil, and

the microscope demonstrated the entire absence of organic structure. The specimen came from the neighborhood of St. Mary's Bay, Digby

MANGANESE DENDRITES ON RED SANDSTONE.
(Reduced to one-fifth of linear dimensions.)

county. The structure of the flag showed that these Manganese dendrites were originally formed between two close layers of the original flaggy sandstone. He suggested as an explanation of the dendritic form of the manganese deposit, the observed fact that when a thin sheet of liquid holds in solution certain substances, and from any cause the solution is becoming supersaturated, these substances, if they have a tendency to crystalize, are not precipitated uniformly like ordinary sediment. The precipitation commences at a point where the supersaturation begins to develope, which, let it be supposed, in the thin plane of cleavage in the flag, was near the outer margin where the deposit salt first made its appearance. Assuming the crystaline attractive force to operate effectively at a distance of, say, the eighth of an inch, the precipitating material would congregate from that distance to the first point of deposition, leaving a clear space of that extent on each side. And as the supersaturation extended inwards, the point would be extended into a line. But, assuming that the wave of supersaturation

proceeds inward with a semi-circular, elliptical or other proximate form of a curve, a radiating system of lines would be required to spring up whenever the divergence between two lines of precipitation exceeded twice the effective attractive distance of the aggregations of deposits. Thus there would result a radiating, spray-like deposit, the branches budding forth at points necessary to allow of the precipitation of all material within the range of the specific attracting force. It will be seen that the branching of each of these figures practically fills up its particular basin so as to accommodate the precipitating molecules within a proximately constant distance.

He illustrated the same, or a similar principle, by enclosing between sets of two microscope glass slides, solutions of a variety of chemical salts, clipping the sides firmly together, and allowing the water to evaporate from the open margins all around. In many of these the salts were precipitated in more or less aborescent and vine-like forms starting from the open margin. Under the polariscope these forms were exhibited to those present, the various plays of color making the exhibition of popular interest.

Dr. A. H. MacKay presented a desiccated specimen of *Diadophis punctatus* (L.), the Ring-necked or King Snake of Nova Scotia, for examination by the members present. The specimen was captured alive during the previous fall, at Pine Hill, near the Park, and was presented to him by the Rev. Dr. Gordon. Its habits in captivity were described, the principal one (not referred to in the other papers read before the Institute) being its ability, after moistening its ventral plates by passing through water, of climbing up the more than vertical walls of a tall glass beaker in which it was kept. As the mouth of this large beaker was covered with a sheet of thin cotton cloth clamped around its mouth by a rubber band, the snake used to climb up to the top and take a circular position around the mouth and as close to the band as possible. For a couple of months it was presented with quite a variety of things to eat and drink, but was never observed to take advantage of what was offered, except to go gliding through the water or other liquid supplied. Being neglected for a week or more towards the beginning of winter, it was found dead and desiccated one day, when the experiments came to a close. It agreed closely with the specimen described in detail by Mr. Harry Piers on the 14th March, 1892. (See Vol. VIII., page 181, Trans. N. S. Inst. Sci.).

He then described an exciting frog hunt by one of three large Garter Snakes, *(Eutainia sirtalis)*—two of them having been killed to give the frog a better chance—which he had the good fortune to see on the partially dry bed of a rivulet near the Nictaux river in Annapolis county. The cunning and persistent determination shown by the snake in this case was most remarkable, whether in swimming and diving in the clear gravel-bottomed pool, or in climbing the rock and the bank.

The infatuation of the frog—a fine large Green Frog, *(Rana clamata)* it appeared to be—was shown by its always retreating to the water where it remained until closely pursued, when it sprang out in a leap or two to one side where it remained unconscious of any other presence, but very sensitive to the insidious approach of the snake who was so interested in its game that the presence of the slaughterer of its two colleagues was, apparently, a matter of no consequence. Owing to a mistaken observation that the frog had finally escaped and that the hunt was over, the snake was killed, when it was discovered that it was still stalking the frog and would have caught him or have forced him again into the pool. As the hunt continued for several minutes, a great many manœuvres by land and water were observed. He referred to notes made on the habits of the same species as described in the Transactions of the Institute, Vol. I, part 2, page 120, by J. M. Jones, May 2nd, 1865; Vol. IV, page 81, by J. Bernard Gilpin, April, 1875; and Vol. IV, page 163, by John T. Mellish, May, 1876.

After discussing the distribution of the Reptillia in the Atlantic Provinces, he gave the appended list which briefly shows all the species known on good authority to be found within the Province of Nova Scotia.

He next presented a living specimen of the Newt, *(Diemyctylus viridescens)*, which was examined by the members, swimming in water and moving on the table. It was one of a pair which had come the spring before from a lake in the county of Lunenburg, and the habits of which he had been studying for a year. The other, having been taken for some time with an apparent longing for the wide world beyond the horizon of its tank, which for some days before it was pensively gazing at from an island rock, must have made a leap or unusual reach, and escaped never to be seen again. He gave an outline of its history from the minute eggs deposited in spring on small leaves of water plants; of its growth in the water, until in August or September it gradually changed into a red land salamander, left the water and hunted like a terrestrial animal, with air breathing apparatus and even a ciliated epithelial lining to its air passages. Until lately this stage used to be considered to be a species of salamander. Then, when mature, the "crimson eft" betakes itself to the water, changes its color to an olive green with a row of minute black-bordered vermilion spots on each side of its back. Its breathing apparatus again becomes adapted to the water, even the ciliated epithelia disappearing. The

specimen was for a year in this speckled olive-green stage, when it is essentially a water animal, although it is capable of living out of the water, and sometimes appears to take pleasure in basking high and dry. Its peculiar and very decided amphibious nature made it even more interesting from a biological point of view than any of its congeners among our batrachians. He described its manner of catching a struggling fly when thrown on the surface of the water, while a dead or motionless fly would not be touched ; its swallowing of small fibres of fresh meat when hungry, when it might be fed from a splinter of wood to which the fibres were made to adhere. He referred to the description of a specimen by Harry Piers, before the Institute, 14th March, 1892, as given in the Transactions of the Institute, Vol. VIII, page 183.

He then discussed the distribution of the other batrachian relatives of the Newt in the Atlantic Provinces, and gave the following list as the species known to belong to the Province, on good authority. In the museum of the Pictou Academy there were specimens of all the reptilia and batrachia of the list except the Wood Tortoise, which was given on the authority of Mr. Jones, in a paper already referred to.

BATRACHIA AND REPTILIA OF NOVA SCOTIA.

[*Nomenclature of Jordan's Manual of the Invertebrates, 1888.*]

Class—BATRACHIANS.

Order—*Salamanders.*

1. Amblystoma punctatum (L). (Yellow-spotted Salamander).
2. Plethodon erythronotus (Green). (Red-backed Salamander).
3. ? (Blackish sp.)

Order—*Newts.*

3. Diemyctylus viridescens (Raf). (Red Eft, or Vermillion-spotted Olive-Back Newt).

Order—*Toads and Frogs.*

4. Bufo lentiginosus (Shaw). (American Toad).
5. Hyla versicolor (Le Conte). (Common Tree Toad).
6. Hyla Pickeringii (Holbrook). (Pickering's Tree Toad).
7. Rana virescens (Kalm). (Leopard Frog).
8. Rana sylvatica (Le Conte). (Wood Frog).
9. Rana clamata (Daudin). (Green Frog).
10. Rana Catesbiana (Shaw). (Bull-Frog).

Class—REPTILES.

Order—*Serpents.*

1. Storeria occipitomaculata (Stor). (Red-Bellied Snake).
2. Eutainia sirtalis (L). (Common Garter Snake).
3. Liopeltis vernalis (DeKay). (Grass Snake).
4. Bascanion constrictor (L). (Black Snake).
5. Diadophis punctatus (L). (Ring-necked Snake).

Order—*Turtles.*

6. Dermochelys coriacea (Vandelli). (Leather Turtle).
7. Chelydra serpentina (L). (Snapping Turtle).
8. Chrysemys picta (Hermann). (Painted Turtle).
9. Chelopus insculptus (Le Conte). (Wood Tortoise).